

What is claimed is:

1. An apparatus, comprising:

a plurality of image manipulating devices, each operating to determine similarities between two image parts; and

a mode switching element, which configures each of said image manipulating devices to determine an entire calculation in a first mode, and configures each of said image manipulating devices to determine only a portion of an entire calculation in a second mode.

2. An apparatus as in claim 1, wherein said image manipulating devices are sum of absolute difference ("SAD") devices.

3. An apparatus as in claim 2, wherein said first mode is a whole SAD mode, in which each SAD receives a different block and source section, and calculates a difference between the whole block and the whole source.

4. An apparatus as in claim 3, wherein said SADs calculate differences between a 16 by 16 reference and a 16 by 16 source, pixel by pixel.

5. An apparatus as in claim 2, wherein said second mode is a mode in which each single SAD performs a fraction of a single block SAD calculation.
6. An apparatus as in claim 5, wherein there are N of said SADs, and each of the N computation units provides 1/N of a total output.
7. An apparatus as in claim 1, further comprising a testing element that determines and selects said first mode or said second mode.
8. An apparatus as in claim 4 wherein, in said first mode, the unit calculates a relation between the entire 16 by 16 reference and the 16 by 16 source, and in said second mode, the unit calculates a fraction of the entire calculation.
9. An apparatus as in claim 1 further comprising a logic unit which detects which of said modes will produce a desired result, and configures a calculation to said mode.

10. A distortion calculating device, comprising;  
a plurality of sum of absolute difference devices, each operating to calculate a total distortion between two image parts; and  
a calculation partitioning element which partitions a calculation between said sum of absolute difference devices based on characteristics of the two image parts.
11. A device as in claim 10 wherein said calculation partitioning element is a switching element which switches between different configurations in which the different sum of absolute difference devices calculate different amounts of a total output calculation.
12. A device as in claim 10 wherein there are said N of said sum of absolute difference devices, and in a first mode, each of said sum of absolute difference devices calculates  $1/N$  of a total calculation.
13. A device as in claim 11 further comprising a logic unit which determines a proper mode of operation.

14. A device as in claim 10, further comprising a logic element that determines said characteristics, and controls said calculation partitioning element based on said characteristics.
15. A device as in claim 14, wherein said calculation is partitioned so that all of a calculation is done by a single sum of absolute difference device.
16. A device as in claim 14, wherein said calculation is partitioned so that only part of a calculation is done by a single sum of absolute difference device.
17. A method of processing an image comprising;  
simultaneously calculating image distortions in a plurality of image distortion calculating devices; and  
configuring said image distortion calculating devices in a first mode in which each device calculates a whole calculation and a second mode in which each device calculates only a part of a calculation.
18. A method as in claim 17 further comprising calculating a whole calculation in said first device representing

a distortion between a source block and a search block.

19. A method as in claim 17 further comprising testing to determine which of a first or second mode will operate more efficiently, and configuring said multiple devices into said first or second mode depending on said testing.

20. A method of processing an image comprising:

calculating a difference between two image parts in a plurality of separate devices; and

configuring said devices in a first mode in which each device calculates a whole calculation and a second mode in which each device calculates only a part of a calculation.

21. A method as in claim 20, wherein said devices are sum of absolute difference devices.

22. A calculating device, comprising:

a video device producing output video signals;

a plurality  $n$  of sum of absolute difference ("SAD") devices, each having a subtract device, an absolute device, and an accumulator, connected to receive said video signals; and

a mode changing device, changing a mode of operation between a first mode in which each SAD device calculates a difference between two image parts of said video signals, and a second mode in which each SAD device calculates  $1/N$  of a total of said video signals.

23. A device as in claim 21, wherein said video device is a video camera.